## REMARKS

Claims 1-18 are pending. Claims 1 and 9 are independent.

Applicant acknowledges with thanks the examiner's indication that claims 3, 5, 6, 8, 13, 17 and 18 would be allowable if re-written in independent form.

Applicant amended independent claim 1 to clarify that the channel defined by the conductive lines has a pitch, and that the conductive lines are configured to capture at least one particle whose diameter is at least equal to or greater than the pitch of the channel. Support for this clarification is provided, for example, at page 6, lines 18-29 of the originally filed application. Applicant similarly amended independent claim 9. Additionally, applicant amended claim 4 to clarify that each of the plurality of devices includes a pair of conductive lines, and amended claims 5-6 to clarify that it is the conductive lines of each of the devices that includes a pitch.

The examiner maintained the rejections of claims 1, 2, 4, 7, 9-12 and 14-16 under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent No. 6,928,892 to Storbeck et al. in view of U.S. Patent No. 5,247,827 to Shah.

Specifically, with respect to independent claim 1 the examiner stated:

> Storbeck discloses a particle detector however, does not expressly disclose the particle detecting integrated circuit including a device having a pair of exposed conductive lines defining a channel (Shah, Fig. 2 shown above show that the electrode/lines define a channel) to receive particles with the pair of exposed conductive lines spaced at a pitch relating to the diameter of particles of interest.
>
> Shah discloses the particle detecting integrated circuit including a device having a pair of exposed conductive lines spaced at a critical pitch corresponding to particles of interest. (Shah. Figure 1 - also see above response to arguments)
>
> The two references are analogous art because they are from a similar problem solving area of particle detection inside a semiconductor processing chamber during manufacturing. (Final Action, pages 4-5)

Additionally, responding to applicant's arguments presented in the Amendment in Reply to Action of March 31, 2006, the examiner stated:

> In regards to the specific detector design Shah discloses the detector is made of two electrodes. Two electrodes are obviously two conductive lines (Shah, Fig. 2 shown below). The spaced lines/electrodes measure the conductivity of particle, which obviously relies on a particle to complete an electrical connection between the two electrodes/conductive lines, therefore it is obvious that they are spaced with a pitch related to the diameter of the particles of interest. If the line are spaced too far apart the particles will pass directly between the lines and not complete the electrical connection, and the detector will not work. As the independent claims are worded, they are not patentably enforceable over Storbeck et al. in view of Shah. (Final Action, pages 2-3)

Applicant respectfully disagrees with the examiner's contentions.

Applicant's independent claim 1 recites "a vacuum chamber containing a particle detecting integrated circuit, the particle detecting integrated circuit including a device having a pair of exposed conductive lines defining a channel having a pitch, the conductive lines configured to capture at least one particle that has a diameter at least equal to or greater than the pitch of the channel." Thus, applicant's apparatus can detect particles by capturing a particle whose diameter is at least equal to or greater than the pitch of the channel. As explained in applicant's originally filed application:

> **Process 100 applies (104) a voltage to the pair of conductive lines and detects (106) a change in an electrical property of the conductive lines resulting from a particle landing on or between the pair of conductive lines. A metallic particle having a diameter the size of the pitch between the lines, or larger, generates a short in a current flow between the lines. A non-metallic particle having a diameter the size of the pitch between the lines, or larger, generates a change in capacitance between the lines. The short and/or change in capacitance is detected by the computer system. Once detected, corrective action can be initiated. (page 6, lines 18-29)**

In contrast, Shah describes an apparatus and method for measuring conductive airborne particulates in which a filter, having a pair of interdigitated electrodes (Abstract). Particularly, Shah explains:

> **Silk screening using a conductive silver-based flexible ink, type A3706 from Engelhard Industries, Inc. of Newark, N.J., then prints an electrode pattern on a side of the mesh 30. The printed electrode pattern is sufficiently thick so as to have relatively negligible resistance compared to the dust being measured. The electrode pattern consists of a pair of interdigitated electrodes 18 and 20 each consisting of a pad 34 or 36 and five electrode fingers 38 or 40. A complementary pair of electrode fingers 38 and 40 are separated by a distance of 0.5 mm. (FIG. 2, col. 2, lines 40-50)**

The electrode fingers imprinted on the mesh 30 have a spacing of 0.5mm. Such spacing is much too large to capture particles, and thus, contrary to the examiner's contention, the conductive lines of Shah's device cannot be said to capture particles whose diameter is at least equal to or greater than the pitch of the channel defined by the conductive lines. Rather, as explained by Shah:

> **A mesh filter element 16 intercepts the air flow 12 and has a mesh size sufficiently small so as to trap particles carried in the air flow 12 on its upstream surface. (col. 2, lines 17-20)**

And:

> **A porous membrane 30 is fused to a plastic collar 32. The filter described to this point is commercially available as part number R2PJ037 from Gelman Sciences, Inc. of Ann Arbor, Mich. under the trade name Teflo filter. The porous membrane 30 of this filter is composed of teflon with a pore size (diameter) of 2 $\mu$m. It has an overall diameter of 3.7 cm. (col. 2, lines 34-40)**

Thus, in Shah's device it is the pores of the mesh that capture the particles, not the interdigitated electrodes. The pores of the mesh, having a diameter of 2 $\mu$m, are small enough to trap particles passing through the mesh. When enough particles are trapped by the mesh and form a cluster of particles that effectively create an electrical path between one digit of one of the electrodes imprinted on the mesh and a digit of the other electrode imprinted on the mesh, the conductivity of the particles can be measured.

Therefore, Shah does not disclose or suggest at least the features of "a device having a pair of exposed conductive lines defining a channel having a pitch, the conductive lines configured to capture at least one particle that has a diameter at least equal to or greater than the pitch of the channel," as required by applicant's independent claim 1.

As for Storbeck, as noted above, the examiner admitted that:

> Storbeck discloses a particle detector however, does not expressly disclose the particle detecting integrated circuit including a device having a pair of exposed conductive lines defining a channel (Shah, Fig. 2 shown above show that the electrode/lines define a channel) to receive particles with the pair of exposed conductive lines spaced at a pitch relating to the diameter of particles of interest. (Office Action, page 4)

Accordingly, because neither Storbeck nor Shah discloses or suggests, alone or in combination, at least the features of "a device having a pair of exposed conductive lines defining a channel having a pitch, the conductive lines configured to capture at least one particle that has a diameter at least equal to or greater than the pitch of the channel," applicant's independent claim 1, and the claims that depend from it, are therefore patentable over the cited art.

Independent claim 9 recites "a particle detecting integrated circuit embedded in the mask stage, the particle detecting integrated circuit containing a device having a pair of conductive lines exposed to a local vacuum environment, the pair of lines defining a channel having a pitch, the conductive lines configured to capture at least one particle that has a diameter at least equal to or greater than the pitch of the channel." For at least similar reasons as those provided with respect to independent claim 1, at least this feature is not disclosed by the cited art. Independent claim 9 and the claims that depend from it are therefore patentable over the cited art.

It is believed that all the rejections and/or objections raised by the examiner have been addressed.

In view of the foregoing, applicant respectfully submits that the application is in condition for allowance and such action is respectfully requested at the examiner's earliest convenience.

All of the dependent claims are patentable for at least the reasons for which the claims on which they depend are patentable.

Canceled claims, if any, have been canceled without prejudice or disclaimer.

Any circumstance in which the applicant has (a) addressed certain comments of the examiner does not mean that the applicant concedes other comments of the examiner, (b) made arguments for the patentability of some claims does not mean that there are not other good reasons for patentability of those claims and other claims, or (c) amended or canceled a claim does not mean that the applicant concedes any of the examiner's positions with respect to that claim or other claims.

No fee is believed due. Please apply any charge or credit to deposit account 06-1050, referencing attorney docket 10559-932001.

Respectfully submitted,

Date: Sept. 9, 2006

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